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Pressurizing Hagan and SAVY containers to 30-psig (air) to measure the release of analytical cerium oxide test powder Title:

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Pressurizing Hagan and SAVY containers to 30-psig (air) to measure the release of analytical cerium oxide test powder

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Summary / Abstract:

In response to an ESS surrounding the storage of sealed sources at TA-55, personnel from RP-SVS (Radiation Protection Services) and ORI-2 (Operational Readiness & Execution) were approached by ES-55 (Facility System Engineering) to provide technical testing of known nuclear material storage containers. Testing criteria were determined by SB-PF (Safety Basis for Plutonium Facilities). Tests were conducted in conjunction with multiple related projects at the Aerosol Sciences Laboratory (TA-03-0130-0103). An experimental system was quickly developed to deliver a pressure pulse (30-psig) that mimics a sealed source burst scenario. A series of twelve tests was conducted. Six tests were done with two different 5QT SAVY-4000 containers, where each SAVY filter-lid combination was subjected to three successive test insults. Three tests were done with a (0.375" diameter filter) 8QT Hagan container, and three tests with a (0.625" diameter filter) 8QT Hagan container. An unused, fresh container filter was used for each tested Hagan container, each receiving only one test insult per filter. Cerium oxide (CeO₂) powder was loaded (100 grams per test) into a nozzle in the tested Hagan and SAVY containers, and the nozzle was hard-plumbed to a ball valve and a pressure source. This system was installed into the Los Alamos RRFMC (Respirable Release Measurement Chamber), which is an integrated multipurpose aerosol wind tunnel that satisfies NQA-1 subpart 2.4 for R&D work. The ball valve was fitted with a mechanical linkage for operation from outside the wind tunnel. An aerodynamic particle sizer counted the particle concentrations and size distributions of released aerosol. Respirable aerosol released during the tests was measured and a correction factor for wind tunnel flowrate and internal duct deposition was applied.

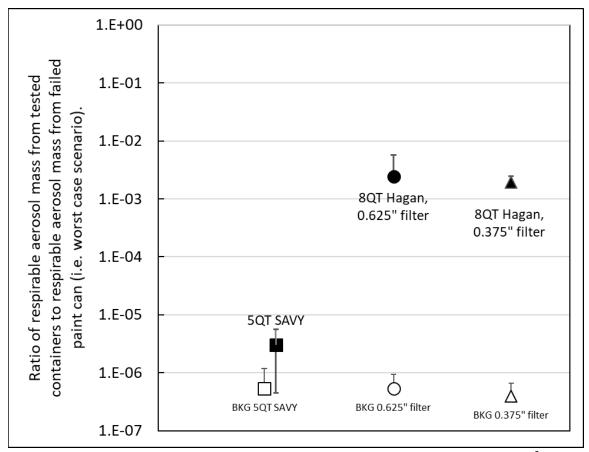
For the tested Hagan and SAVY containers with an initial powder load of 100 g, there was zero released mass (0.0 ± 0.1 g before and after the pressure tests). Therefore, less than 0.1% of the powder test mass was released. An aerosol particle counter measured the respirable and airborne aerosol in the Los Alamos RRFMC (Respirable Release Fraction Measurement Chamber).

Summary table for SAVY and Hagan containers (net released, respirable and airborne masses).

gari ooritairic	15 (not released, respirable di	ia ali borrio rriassos).
Net	Net Uncertainty	Net Uncertainty
released	respirable ± respirable	airborne ± airborne mass
mass ¹ , g	mass ² , g mass (net) ² , g	$ mass^2, g $ $ (net)^2, g $
0.0 ± 0.1 a	2 16F 06 ± 6 71F 06	$2.16\text{E-}06 \pm 6.71\text{E-}06$
0.0 ± 0.1 g	2.10E-00 ± 0.71E-00	2.10E-00 ± 0.71E-00
$0.0 \pm 0.1 \; g$	$2.32E-03 \pm 5.26E-03$	$2.36E-03 \pm 5.33E-03$
$0.0 \pm 0.1 \mathrm{g}$	$1.25E-03 \pm 2.23E-03$	$1.33E-03 \pm 2.40E-03$
	Net released mass 1 , g 0.0 ± 0.1 g 0.0 ± 0.1 g	released mass ¹ , g mass ² , g \pm respirable mass (net) ² , g 0.0 ± 0.1 g $2.16\text{E}-06 \pm 6.71\text{E}-06$ 0.0 ± 0.1 g $2.32\text{E}-03 \pm 5.26\text{E}-03$

- (1) Measured with a Model SR64001 mass balance (Mettler Inc. (Columbus OH).
- (2) Measured with a Model 3321 APS Aerodynamic Particle Sizer (TSI Inc Shoreview MN).

The released respirable mass amounts were compared to a worst-case test with a two-gallon crimp seal pail. In that test, the crimp seal lid failed under a 30-psig pressure pulse, with 0.72 g of net respirable aerosol ($< 10 \mu m$ AED, aerodynamic equivalent diameter).



Summary figure. The ratio of released respirable mass from the Hagan (about 10^{-3}) and SAVY (about 10^{-6}) containers compared to the released respirable mass of 0.72 g from a two-gallon Cary Co. crimp seal pail.

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Introduction:

The need to pressure-test known nuclear material storage containers has been made apparent by the CSE (cognizant systems engineer) assigned to containers at TA-55. The main goal of the pressure tests in the current study is to understand if the SAVY-4000 and Hagan containers are robust enough to withstand a 30-psig over-pressurization.

Materials and Methods:

An experimental system was developed to deliver a pressure pulse that mimics a sealed source burst scenario. A series of twelve tests was conducted, six tests with 5 QT SAVY-4000 and six tests with 8 QT Hagan containers (Table 1). Note that two different SAVY lids were subjected to three successive test insults, while the Hagan container filters only received one test insult per filter (Table 1). Before the tests, the filters were visually inspected, and all containers, lids and O-rings were in good physical condition.

Table 1. Two different SAVY lids were subjected to three test insults. Hagan container filters only received one test insult per filter. The test indices correspond to the data filenames for this work.

Test indices for the 30-psig pressurizations	Container type and lid ID number
SAVY 1 st , 2 nd , 3 rd	5QT SAVY; Lid # 081305135L
SAVY 4 th , 5 th , 6 th	5QT SAVY; Lid # 012005142L
Hagan 0.625" filter (one test per filter) 2 nd , 3 rd , 4 th	8QT Hagan NUCFIL-019 2-08 LANL 3012
Hagan 0.375" filter (one test per filter) 1st, 5th, 6th	8QT Hagan NUCFIL-013 10-02 LANL 2062



Figure 1. Cerium oxide powder inside a SAVY container before pressurization test.

Cerium oxide (CeO_2) powder was loaded into a nozzle that was fixed inside of each container (Figure 1). Powder masses were tare-weighed (Table 2) on a Mettler Inc. (Columbus OH) model SR64001 mass balance (Los Alamos S&CL ID #028289, calibration due 4-27-2021). The rated instrument uncertainty is ± 0.1 g. The same mass balance was used to weigh the tested containers after the pressurization tests.

Table 2. Tested containers were loaded with cerium oxide test powder.

Container	MAR(g)
1st SAVY	100.0
2nd SAVY	100.2
3rd SAVY	100.2
4th SAVY	100.0
5th SAVY	100.5
6th SAVY	100.8
(2nd Hagan 0.625-dia)	100.9
(3rd Hagan 0.625-dia)	99.7
(4th Hagan 0.625-dia)	100.0
(1st Hagan 0.375-dia)	100.3
(5th Hagan 0.375-dia)	100.2
(6th Hagan 0.375-dia)	100.0

A 47 mm filter holder (model RVPH-20 HI-Q Inc San Diego CA) with a honeycomb backing mesh (4 mm diameter openings) was used to support a stainless steel mesh (Fisher Sci 59-004648-0010) screen (125 μ m holes, and 23% open area fraction). The RVPH-20 filter holder has a 42 mm effective diameter, but the custom nozzle flares out to an opening with a 47 mm diameter (Figures 2 and 3). Note the direction of air flow in the nozzle (for these tests) is reverse to the intended direction, if this were an air sampling application.



Figure 2. HI-Q Inc 47 mm filter holder, steel mesh screen and custom 47 mm diameter nozzle.



Figure 3. Assembled nozzle system.

The containers were attached (Figure 4) to an intermediate (ASME rated) pressure vessel (Drierite Inc model 106-C) and installed (Figure 5) into the Los Alamos RRFMC (Respirable Release Measurement Chamber).

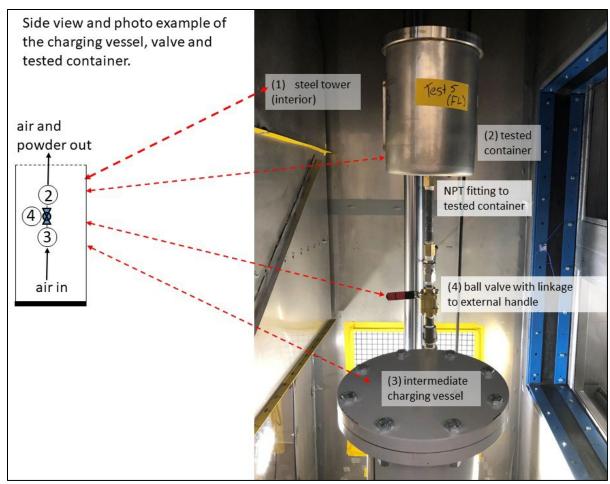


Figure 4. Intermediate charging vessel, ball valve and test container.

The RRFMC (Moore Tao and Karns 2018) is an experimental drop tower system (Figure 5) integrated into a HEPA filtered aerosol wind tunnel that satisfies NQA-1 subpart 2.4 for R&D work. It drop-tests nuclear material storage containers loaded with cerium oxide powder and measures the released respirable (< 10 μ m AED, aerodynamic equivalent diameter) aerosol and airborne (< 20 μ m AED) aerosol with an APS (Aerodynamic Particle Sizer) unit (TSI Inc. Shoreview MN).

Net aerosol mass measured by the system is:

$$m(aerosol) = C_P(\frac{g}{m^3}) * FR(\frac{m^3}{min}) * T_S(min)$$

Eq. 1

 C_P = respirable or airborne aerosol concentration measured by the APS system, corrected for aerosol deposition losses in the wind tunnel (g/m³),

FR = RRFMC total air flow rate, measured in the duct upstream of the APS (m^3/min), and, Ts = APS sampling interval (1 min).

After the container was loaded in the HEPA filtered RRFMC wind tunnel, the access door was closed and the APS (Figure 6) was started before the pressure pulse test to gather

background aerosol measurements and establish a baseline. The intermediate pressure vessel was charged to slightly more than the 30-psig test value, with allowance for the combined volumes of the intermediate vessel and the tested container. To pulse the container and evacuate the CeO₂ test powder out of the nozzle, a ball valve was manually cycled (opened and closed) using a mechanical linkage from outside the drop tower. The combined volume of the intermediate vessel and the tested container would equilibrate to the 30-psig test pressure, and the APS then measured any released aerosol in the downstream portion of the wind tunnel.

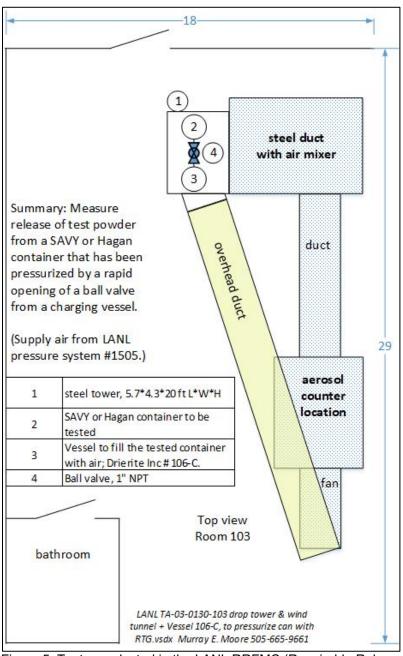


Figure 5. Tests conducted in the LANL RRFMC (Respirable Release Fraction Measurement Chamber).



Figure 6. TSI Inc. model 3321 APS Aerodynamic Particle Sizer

The RRFMC drop tower has been specifically designed to conduct a variety of container drop tests. It has an integrated pressure system, with an approved LANL ID number, and its individual components are operationally pressure rated. For these pressurized powder tests, the existing Drierite 106-C air drier (already contained in the pressure system) was repurposed (it is an ASME-rated pressure vessel) as the intermediate charging vessel for safe operation of these tests. The Drierite 106-C is normally used to supply ultra-dry airflow for experiments involving liquid droplet aerosol generation. Liquid droplet aerosol generation was not relevant to these tests, and the drop tower was quickly retrofitted for the pressure pulse testing activities. This preparation period (i.e. four weeks) allowed for a timely gathering of test data.

The first pressurized powder test used a two gallon pail (Cary Co. model #26W098) with a 1-mm diameter orifice in the lid of the pail (Figure 7). A 0.5-mm diameter orifice would have the same pressure drop characteristics as a nominal Hagan or SAVY filter, i.e. about a 0.6 inWC (inches of water column) for an airflow rate of 0.2 ALPM. For this current project, only an orifice of 1-mm diameter was possible, given the time allowed for this effort.



Figure 7. Two gallon (#26W098) pail (Cary Co., Addison IL)

Results:

Note all of the Hagan and SAVY containers (Table 2) had zero measured released mass (0.0±0.1 g before and after the pressure tests) as measured by the Mettler™ mass balance (Summary table and Table 3). Compared to the nominal test powder MAR mass of 100 g, less than 0.1% of the powder test mass was released.

For the 2 gallon Cary container (Figure 8A and 8B), with the 100.0 g test load of powder, the container lid was dislodged (Figure 8C), 42.5 g of powder was retained in the container (Figure 8D), and the total released mass value was 57.5 g.

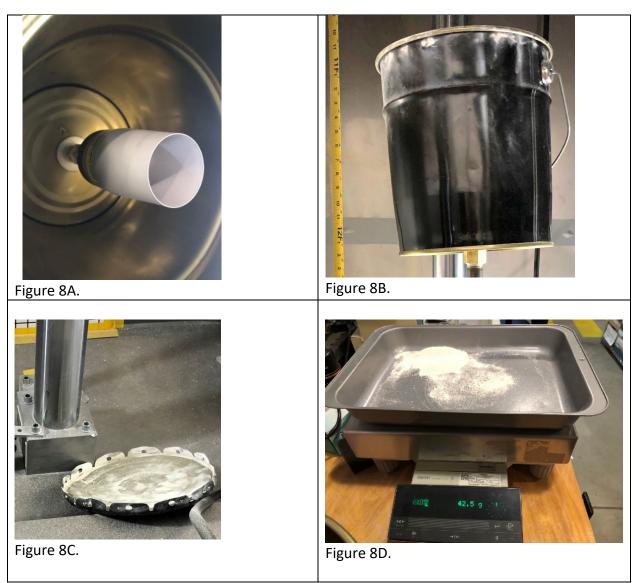


Figure 8. Photos of the Cary(TM) can before the test (8A), after the test (8B), the lid after the test (8C) and measurement of the powder retained in the container (8D).

The APS system produces tabular and graphical outputs of aerosol particle size and mass concentrations. Figures 9 and 10 give a snapshot from one Hagan container, and Figures 11 and 12 are from one of the SAVY tests.

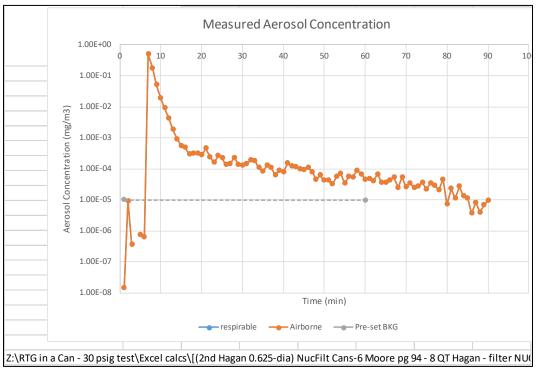


Figure 9. Aerosol concentration versus time after the test (7 min mark) for the "2nd tested Hagan".

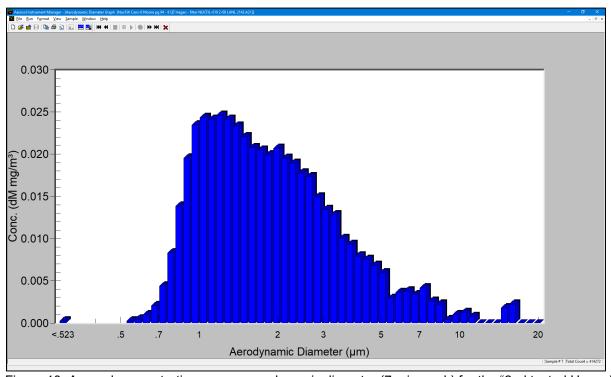


Figure 10. Aerosol concentration versus aerodynamic diameter (7 min mark) for the "2nd tested Hagan".

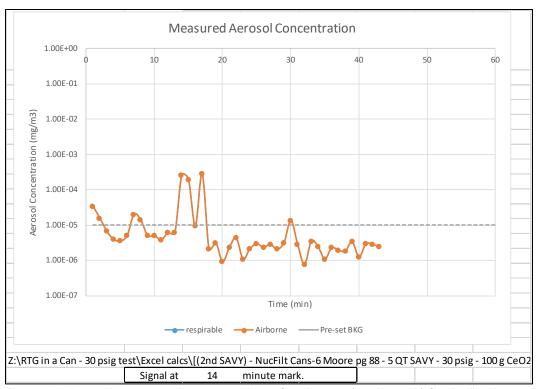


Figure 11. Aerosol concentration versus time after the test (7 min mark) for the "2nd tested SAVY".

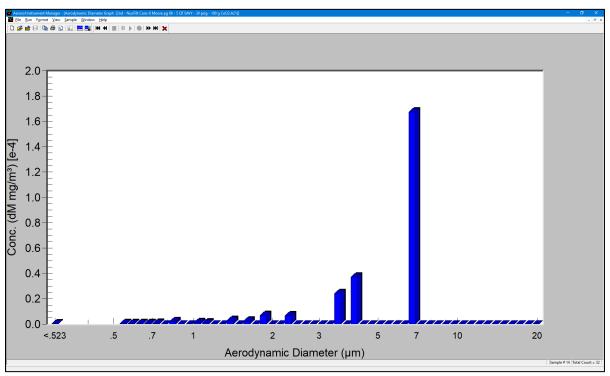


Figure 12. Aerosol concentration versus aerodynamic diameter (7 min mark) for the "2nd tested SAVY".

The APS measurements were used to produce estimates of the net respirable and net airborne mass (Table 3).

Table 3. Estimate measurements of the respirable and airborne mass, based on Equation 1.

Because the test mass was 100 g	Net	Net Uncertainty	Net Uncertainty
of powder, these gram quantities	released	respirable ± respirable	airborne ± airborne mass
are also the "percent" values.	mass ¹ , g	mass ² , g mass (net) ² , g	$ mass^2, g (net)^2, g$
5QT SAVY Avg and Combined	$0.0 \pm 0.1 \; g$	2.16E-06 ± 6.71E-06	2.16E-06 ± 6.71E-06
Uncertainty	0.0 ± 0.1 g	2.10E-00 ± 0.71E-00	2.10E-00 ± 0.71E-00
8QT Hagan 0.625-dia filter.			
(Average and Combined	$0.0 \pm 0.1 \; \mathrm{g}$	$2.32E-03 \pm 5.26E-03$	$2.36E-03 \pm 5.33E-03$
Uncertainty)			
8 QT Hagan 0.375-dia filter			
(Average and Combined	$0.0 \pm 0.1 \mathrm{g}$	$1.25E-03 \pm 2.23E-03$	$1.33E-03 \pm 2.40E-03$
Uncertainty			

- (1) Measured with a Model SR64001 mass balance (Mettler Inc. (Columbus OH).
- (2) Measured with a Model 3321 APS Aerodynamic Particle Sizer (TSI Inc Shoreview MN).

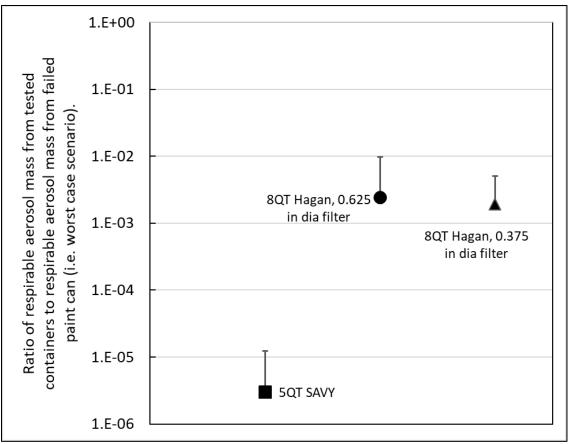


Figure 13. The average ratio of released respirable mass from the tested Hagan and SAVY containers compared to the released respirable mass of 0.72 g from a two-gallon Cary Co. pail (Table 4).

Table 4. Summary of pressure pulse tests at 30-psig for Hagan and SAVY containers.

SUMMARY. RESPIRABLE MASS RATIO

Ratio of measured respirable aerosol mass from the tested containers, divided by the respirable aerosol mass (0.72 g) from a two-gallon Cary Co. crimp seal pail (i.e. worst case scenario).

Test	Ratio		Standard Deviation
5QT SAVY	3.02E-06	±	9.37E-06
8QT Hagan, 0.625 in dia filter	2.43E-03	±	7.34E-03
8QT Hagan, 0.375 in dia filter	1.91E-03	±	3.12E-03

	Net		Uncertainty	Net		Uncertainty
	respirable	±	respirable	airborne	±	airborne
	mass, g		mass (net), g	mass, g		mass (net), g
2 gallon can, 1 mm orifice. Lid dislodged.	7.16E-01	±	8.60E-02	8.79E-01	±	1.04E-01

Discussion and Conclusions:

From a structural standpoint, the SAVY-4000 and the Hagan container performed very similarly. After the 30-psig test pulses, there were no visual indications of bulging of the container body in either container type. The SAVY-4000 container was tested in other pressure related work at New Mexico Tech, where the container was exposed to pneumatic and hydrostatic pressure insults. In those tests, the SAVY-4000 containers began showing visual signs of plastic deformation at approximately 60-psig from internal pressure insults. Since this current work did not approach that internal 60-psig pressure, we were confident that complications would not arise.

However, we did not have the same history for the Hagan, as this specific type of "pressure pulse" test had never been conducted. In the current test, the Hagan still performed well in this respect, and did not indicate deformation or bulging for an estimated force of 1,100 lbf on the internal face of each lid.

For all the tests, this force impulse did not have an apparent negative effect on the structural performance. This is a key result, as the pressure pulse did not permanently disfigure the sealing surfaces and method of closure, therefore maintaining and reproducing the performance of their respective design functions. Upon completion of each test, the sealing surfaces of each container were inspected for damage, unrecoverable debris lodged in the filter media, and general damage to the filter media etc.

The Hagan filter media is an area of concern when evaluating the complete container performance. In the current tests, both of the SAVY and Hagan filters captured the expelled surrogate material with differing levels of effectiveness and the filter media remained intact. In the case of the Hagan, the carbon fiber media is directly exposed to the incoming powder in a single circular cross section. However, the physical impact of the powder did not dislodge any visible piece of the filter media, and the filter components retained their structural rigidity.

In the SAVY container, the filter material has less direct exposure to powder because of the recessed smaller holes in the filter cup. During the pressure pulse tests, powder impacted onto the filter media during the tests. The small diffusion holes in the filter cup assembly allowed multiple locations for the test powder to cling to the filter material. Impacted powder was removed after tests two and three, and tests five and six respectively. However, even with a HEPA-filtered vacuum cleaner, there were small amounts of material that could not be removed. This powder was not observed to build up and clog the filter during the subsequent tests. This topic has been an area of concern in the past regarding filter performance due to corrosion inside of the container during normal storage conditions inside the plant.

Overall, the results match many of the known performance characteristics of the two containers that were tested. The SAVY-4000 allowed the passage of about 10^{-6} of the challenge powder material (compared to the 0.72 g of powder measured in the worst-case test). The Hagan allowed the passage of about 10^{-3} of the challenge powder material.

The LANL facility operations and safety basis personnel can utilize this information to determine if these containers are viable storage systems. The performance of these containers is important for laboratory safety, and this information is valuable for the container designers to ensure a viable and reliable product for the TA-55 PF-4 facility and for the DOE complex at large.

References

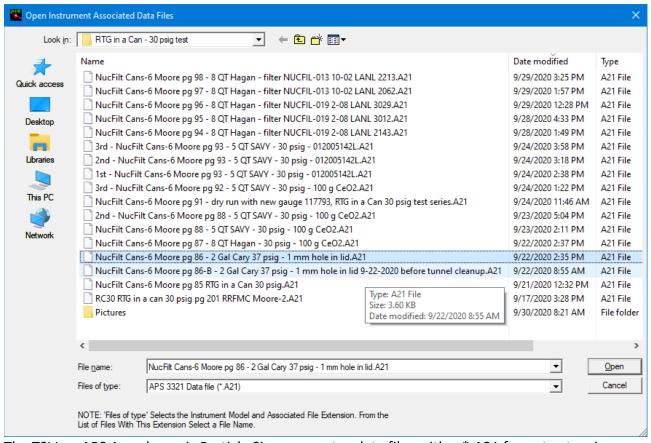
Moore ME, Tao Y and Karns T. 2018 Respirable Release Fraction Measurement Chamber (RRFMC) specification sheet. Los Alamos National Laboratory Unrestricted Release. LAUR-18-31809.

Tao Y and ME Moore. 2018. Measuring Monodisperse Aerosol Transmission in the Los Alamos Respirable Release Fraction Measurement Chamber. 63rd Health Physics Soc. Cleveland OH. Los Alamos National Laboratory Unrestricted Release. LA-UR-25745.

Appendices

Ratio of measured respirable aerosol mass from the tested containers, divided by the respirable aerosol mass from a failed paint can (i.e. worst case scenario).

case scenario).			
Test	Ratio		Standard Deviation
1st SAVY	1.24E-06		N/A
2nd SAVY	7.90E-06		N/A
3rd SAVY	2.50E-06		N/A
4th SAVY	3.16E-06		N/A
5th SAVY	6.38E-07		N/A
6th SAVY	2.67E-06		N/A
5QT SAVY	3.02E-06	±	9.37E-06
(2nd Hagan 0.625-dia)	7.07E-03		N/A
(3rd Hagan 0.625-dia)	1.74E-03		N/A
(4th Hagan 0.625-dia)	9.19E-04		N/A
8QT Hagan, 0.625 in	2.43E-03	±	7.34E-03
dia filter	2. 1 3L-03		7.5 1 L-05
(1st Hagan 0.375-dia)	1.15E-03		N/A
(5th Hagan 0.375-dia)	1.78E-03		N/A
(6th Hagan 0.375-dia)	2.29E-03		N/A
8QT Hagan, 0.375 in dia filter	1.91E-03	±	3.12E-03



The TSI Inc. APS Aerodynamic Particle Sizer generates data files with a *.A21 format extension.

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							16
	d windtunnel information (the same for	ST SAVY	TEST	0.5		- /	(P688
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[6]	(optional) Tunnel AC/heat setpoint	T(°F)				/	
[7]	(optional) Humidifier setpoint RH%					/	
[8]	T(°F) LANL TA-6	RH% LANL	TA-6		Time of LA	NL TA-6 d	ata ——
[13]	Wind Tunnel Speed, Hz 24	42					
[14]	Air Velocity at location #4, m/s	110		Flow Rate a	t location #	4, m ³ /s	
[15]	Tunnel Temp. T(°F)		i.	Tunnel Hur	-		
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[9]	Total weight of dummy container:			,	/		
[10]	Drop orientation:		12.2	Angle before	re drop	г	lara a t i i i
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B C	Side		Top down	jiui /		- 11	Sup down
	BKE before lest ~ 2	*10-51	ma/m3	/			
[17]	Dummy container sampling schedu						
[22]	Tape measure, T(in)=	Platen offs	et, P = 17 ir	1	Drop heigh	t, T-P = H	+ ∆H =
[32]	Filename of aerosol particle counte	7005		/			
[37]	Post-test dummy observation:	TOT GUITITI	y diop.	T			
			Value (Yang)				
	ontainer Information (requires a new,	second pun	ichiist)				
[9]	Container type and serial number:						
[9]	Container Size:						
[9]	Type note: no lid?						
[9]	Payload description:						
[9]	MAR CeO2 mass (g):			Container	mass w/o C	eO2 (g):	
[9]	Container mass w/ CeO2, m1(g):						
[10]	Drop Orientation:			Angle befo	re drop		
[17]	Tested container sampling schedule	e for aeroso					
[22]	Tape measure, T(in)=			set = 17 in; E	rop height,	T-P = H +	ΔΗ =
[29]	Sample number of the aerosol part			0;			
[32]	Filename of aerosol particle counte	i ioi tested	container:				
[32]	Filename in hi-speed camera 1:						
[34]	Container mass after drop, m2(g):						
	m(released) = m1-m2, (g) =			DR=Damag	e Ratio, (m	1-m2)/MA	AR =
[34]	DR Filter weight before, g:				eight after,		
[34]	Post test container observation:						
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[34] [35] [37] Drop tes	ter - RRFMC\Operation procedure\RP-SVS-RIC		T	1		-	
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[34] [35] [37] \Drop tes ower &	container cleaning steps Preliminary Steps				1		
[34] [35] [37] (Drop tes	Preliminary Steps Spray silicone into HEPA cabinet &	n cloth	er		1		



2ND SAVY Ø113Ø5ØØB LID-Ø813Ø5135L Using drop tower punchlist. 2nd-Nuclit-6 Moore p. 88 SQT SAVY-30 priz - (OOG COOZ .AZ)

Containe	r drop information sheet		6 in CAN	sents		
Room and	windtunnel information (the same	for the dun	nmy and also the test	ed container)		
[2]	Date: 9-23-2020	Operator	MOORE	Logbook name	& pag	e: p. 88 New Filt #4
[5]	Room AC/heater setpoint T(°F)			Room Temp. T	(°F)	
[6]	(optional) Tunnel AC/heat setpoir	nt T(°F)				
[7]	(optional) Humidifier setpoint RH					
[8]	T(°F) LANL TA-6	RH% LAN	I TA-6	Time of LANL	A-6 da	nta
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[13]	Wind Tunnel Speed, Hz					
[14]	Air Velocity at location #4, m/s		Flow R	ate at location #4, r	n³/s	
[15]	Tunnel Temp. T(°F)		Tunnel	Humidity RH%		
Dummy Co	ontainer Information (for measurin	g RRFMC ba	ckground)			
[9]	Dummy container type:					
[9]	Total weight of dummy container	1				
[10]	Drop orientation:	all .	Angle I	before drop		
.etter	SAR Orientation	Letter	SAR Orientation	Let	er	SAR Orientation
Α	CG over top corner	D	Top down on hand	lle	G	Bottom down flat
В	CG over bottom corner	F	Top down flat		Н	Slap down
С	Side					
[9] [9]	Filename of aerosol particle coun Post-test dummy observation: ntainer Information (requires a new Container type and serial number Container Size:	w, second pur:	unchlist)			
[9]	Type note: no lid? PULSE	AP O	N #13			
[9]	Payload description:					
[9]	MAR CeO2 mass (g):		Contai	ner mass w/o CeO2	(g):	
[9]	Container mass w/ CeO2, m1(g):		6			
[10]	Drop Orientation: PLUSE EN			before drop	/	
[17]	Tested container sampling sched	ule for aeros	of particle counter:	fer # DAD	PUL.	56
[22]	Tape measure, T(in)=		Platen offset = 17	in; Drop height, T-F	H+	ΔH =
[29]	Sample number of the aerosol pa	rticle count	er at the drop:	lesson &	ea &	ned-
[32]	Filename of aerosol particle cour	ter for teste	d container: 🗽	nduett co	rie	et
[32]	Filename in hi-speed camera 1:	valve	sequence	en con	me	eson
[32]	Filename in hi-speed camera 2:	5/00	#(3)		1	
[34]	Container mass after drop, m2(g)	: ' /				
10.13	m(released) = m1-m2, (g) =		DR=Da	amage Ratio, (m1-m	2)/MA	.R =
[34]	Introduced - Int Int, (B) -					
[34]	DR Filter weight before, g:		DR filt	er weight after, g:		

	Preliminary Steps	Note	Operator number*	Assistant number
1	Spray silicone into HEPA cabinet & generic m	ixer		
2	Wipe RRFMC floor with clean cotton cloth			
3	Wipe the test container with a damp paper t	owel		
4				



Second SAVY Test

Second SAVY Test

Opera	tion procedure punchlist and container information sl	7	1-	Maria California (California California Cali	unchlist
	Preliminary Steps	Note	Operator number	Assistant number	powder
1	Walk through room 103 and organize work area.		Inditibel	Hamber	
2	Record the date, operator, logbook name & page.		1		
3	Record serial number and volume of test can.	(felow)	1		
4	Note room temp (deg F). (73)	m 2	† ·		
5	Open Z:\RTG in a Can - 30 psig test\RTG in a Can - 30	osia Baxisx Morore ME 2020	RTEMA	Can-30.	sig lest.X
6	Calculate charging pressure for gray 9 gallon Drierite		1		0
7	Note charging pressure (psig):	Pressure (psig): 34			
8	Ensure vessel 106-C will not initially be pressure charge	ged.	1		
9	Note valve V5 is open, to not charge vessel 106-C.		1		
10	Note valve V6 is closed, to not charge vessel 106-C.		1		
	In Process Steps		1	-7	
11	Prepare container to be tested.		72	2	
12	Install test can above ball valve on vessel 106-C.		-	2	
13	Close and lock tower door. Seal with "In Use" yellow	tape.	-	2	
14	Turn on air compressor		-	2	
15 16	Turn on air compressor. Adjust regulator PCV1 and use PRV1 to set and note of	harging pressure: IF heeded	-	2	
17	Set and record wind tunnel speed (Hz):	marging pressurey [F Fiberack	1	-	
18	Set and record wind cumer speed (nz).				
19	Note valve V5 is closed to charge voscal 106 C			2	
20	Note valve V5 is closed, to charge vessel 106-C.	*		2	
-	Note valve V6 is open, to charge vessel 106-C.		-		
21	Verify gray vessel Drierite 106-C is pressurized.			2	
22	Verify charging (system) pressure on PI3:				
23	corrected on 1	Moore offer Davis com	ment		
24	Turn aerosol particle counter on.	0			
(25)	Start AIM software for drop test sampling (60 sec cou	nt, 90 count cycles) 1:03:00	1		
26	Pre-drop BKG concentration validation. Note five cycl	es of 1 minute. Sxic > 5xio 8 3	0-3.34	1X1 .5-01	-4:58
27	8 1 10 10 1 11	its; lowlook & peak, again	town	7 7 17	106
	Trutter				0.
28	rest fremane w/ tormat 185+ 50				
28	Toggle ball valve above gray vessel Drierite 106-C for	a one to two second pulse.			
29	rest fremane w/ tormat 185+ 50	a one to two second pulse.			
	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter	a one to two second pulse.			
29	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter Post-test Steps	a one to two second pulse.			
29 30	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter	a one to two second pulse. Sample number at pulse: 7th			
29 30 31	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter Post-test Steps Save data files, record file names and location	a one to two second pulse. Sample number at pulse: 7th			
29 30 31 32	Toggle ball valve above gray vessel Drierite 106-C for Note sample number of aerosol particle counter Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op	a one to two second pulse. Sample number at pulse: 7th			
29 30 31 32 33 34 35	Toggle ball valve above gray vessel Drierite 106-C for, Note sample number of aerosol particle counter Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR measurement (Optional) DR Measurement filter.	a one to two second pulse. Sample number at pulse: 7(h) ening door.		,	
29 30 31 32 33 34 35 36	Toggle ball valve above gray vessel Drierite 106-C for, Note sample number of aerosol particle counter Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR measurement (Optional) DR Measurement filter. Turn air compressor off	a one to two second pulse. Sample number at pulse: 7(h) ening door.			
29 30 31 32 33 34 35 36 37	Toggle ball valve above gray vessel Drierite 106-C for, Note sample number of aerosol particle counter Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR measurement (Optional) DR Measurement filter. Turn air compressor off Open Moed or Perform post-test activities	a one to two second pulse. Sample number at pulse: 7(h) ening door.			
29 30 31 32 33 34 35 36	Toggle ball valve above gray vessel Drierite 106-C for Note sample number of aerosol particle counter Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR measurement (Optional) DR Measurement filter. Turn air compressor off Open More Stephen	a one to two second pulse. Sample number at pulse: 7th ening door.			
29 30 31 32 33 34 35 36 37	Toggle ball valve above gray vessel Drierite 106-C for Note sample number of aerosol particle counter Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR Measurement (Optional) DR Measurement filter. Turn air compressor off — Open Moed or Perform post-test activities RRFMC data analysis and test report.	a one to two second pulse. Sample number at pulse: 7th ening door.			
29 30 31 32 33 34 35 36 37	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter (2) Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR measurement (Optional) DR Measurement filter. Turn air compressor off — Open Model of Perform post-test activities RRFMC data analysis and test report.	a one to two second pulse. Sample number at pulse: 7th ening door. D) 813051352 Shock for IST & 2ND.			
29 30 31 32 33 34 35 36 37	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter (2) Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR measurement (Optional) DR Measurement filter. Turn air compressor off — Open Model of Perform post-test activities RRFMC data analysis and test report. 3 D PULSE THIS LUI — SEE ARE LUI Date: 7-24-20-70	a one to two second pulse. Sample number at pulse: 7th ening door. D) 813051352 Shock for Ist & 2nn Assistant 2: DAVIS			
29 30 31 32 33 34 35 36 37	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter (2) Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR measurement (Optional) DR Measurement filter. Turn air compressor off — open Model to Perform post-test activities RRFMC data analysis and test report. 3 fD PMIS E THIS MD — see — 88 de Date: 7-2 floor 20 Logbook: MCFILT-6-ModRE p. 92	a one to two second pulse. Sample number at pulse: 7th ening door. Description of the first standard and the fi			
29 30 31 32 33 34 35 36 37	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter (2) Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR measurement (Optional) DR Measurement filter. Turn air compressor off — open Model to Perform post-test activities RRFMC data analysis and test report. 3 fD PMSE THIS MID — SEE — 38 MID — 100	a one to two second pulse. Sample number at pulse: 7th ening door. ening door. Assistant 2: DAVIS: Assistant 3: Assistant 4:			
29 30 31 32 33 34 35 36 37	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter (2) Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR measurement (Optional) DR Measurement filter. Turn air compressor off — open Model to Perform post-test activities RRFMC data analysis and test report. 3 fD PMIS E THIS MD — see — 88 de Date: 7-2 floor 20 Logbook: MCFILT-6-ModRE p. 92	a one to two second pulse. Sample number at pulse: 7th ening door. ening door. Assistant 2: DAVIS: Assistant 3: Assistant 4:			
29 30 31 32 33 34 35 36 37	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter (2) Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR Measurement (Optional) DR Measurement filter. Turn air compressor off perform post-test activities RRFMC data analysis and test report. 3 ftp Puls to The Lub - see 1.88 de Date: 9-24-20 % Date: 9-24-20 % Operator 1: Mothe Note: Only record the operator number after complete	a one to two second pulse. Sample number at pulse: 7th ening door. Door for 150 & 200 1 Assistant 2: DAVIS 1 Assistant 3: Assistant 4: etion of the step.			
29 30 31 32 33 34 35 36 37 38	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter (2) Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR measurement (Optional) DR Measurement filter. Turn air compressor off — open Model to Perform post-test activities RRFMC data analysis and test report. 3 fD PMSE THIS MID — SEE — 38 MID — 100	a one to two second pulse. Sample number at pulse: 7th ening door. Door for 150 & 200 1 Assistant 2: DAVIS 1 Assistant 3: Assistant 4: etion of the step.			
29 30 31 32 33 34 35 36 37 38	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter (2) Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR Measurement (Optional) DR Measurement filter. Turn air compressor off — Open Model to Perform post-test activities RRFMC data analysis and test report. 3 LP PULS ETHELLY — SEE ARB LO Date: 7-2 1/20 20 Logbook: MCFLT-6-MODRE P. 92 Operator 1: MODRE Note: Only record the operator number after comple Z:\RTG in a Can - 30 psig test\ Punchlist - RTG in a Can - 30 psig-88 & container cleaning steps	a one to two second pulse. Sample number at pulse: The sa	Operator	Assistant	
29 30 31 32 33 34 35 36 37 38	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter (2) Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR Measurement (Optional) DR Measurement filter. Turn air compressor off Open Model of Perform post-test activities RRFMC data analysis and test report. 3 fo Pulse This Lip - see 188 de Date: 7-24-20 models p. 92- Openator 1: Modele Note: Only record the operator number after complex Note: Only record the operator number after complex 2:\RTG in a Can - 30 psig test\[Punchlist - RTG in a Can - 30 psig-	a one to two second pulse. Sample number at pulse: 7th ening door. Door for 150 & 200 1 Assistant 2: DAVIS 1 Assistant 3: Assistant 4: etion of the step.		Assistant	
29 30 31 32 33 34 35 36 37 38	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter (2) Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR Measurement (Optional) DR Measurement filter. Turn air compressor off — Open Model to Perform post-test activities RRFMC data analysis and test report. 3 LP PULS ETHELLY — SEE ARB LO Date: 7-2 1/20 20 Logbook: MCFLT-6-MODRE P. 92 Operator 1: MODRE Note: Only record the operator number after comple Z:\RTG in a Can - 30 psig test\ Punchlist - RTG in a Can - 30 psig-88 & container cleaning steps	a one to two second pulse. Sample number at pulse: The sa	Operator		
29 30 31 32 33 34 35 36 37 38	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter (P) Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR Measurement (Optional) DR Measurement filter. Turn air compressor off — Open Moed of Perform post-test activities RRFMC data analysis and test report. 3 LD PMS E THIS MD — SEE D. 88 MD Date: 7-2 1/20 VO Logbook: MCCLUT-6-MORKE D. 92 Operator 1: MORKE Note: Only record the operator number after complex 2:\RTG in a Can - 30 psig test\ Punchlist - RTG in a Can - 30 psig. 8 container cleaning steps Preliminary Steps	a one to two second pulse. Sample number at pulse: The sa	Operator		
29 30 31 32 33 34 35 36 37 38	Toggle ball valve above gray vessel Drierite 106-C for. Note sample number of aerosol particle counter (2) Post-test Steps Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before op Open RRFMC door (Optional) DR Measurement (Optional) DR Measurement filter. Turn air compressor off — Open Moed or Perform post-test activities RRFMC data analysis and test report. 3 Ap Phus E This Lip — see , 88 de Date: 7 2 1 20 20 Logbook: MCCFLT -6 — Morrie D. 92 Operator 1: Morrie Derot the operator number after complete Secondariner cleaning steps Preliminary Steps Spray silicone into HEPA cabinet & generic mixer	a one to two second pulse. Sample number at pulse: The sa	Operator		



Third SAVY Test

Third SAVY Test

1 2 3 4	Preliminary Steps Not Walk through room 103 and organize work area.	te 🦸	Operator number	Assistant number
3		1	number	number
3	walk through room 103 and organize work area.			
3			- 1	
	Record the date, operator, logbook name & page.		1	
1 1	Record serial number and volume of test can.		1	
_	Note room temp (deg F). (74) Moure ME 200	0	1.	
5	Open Z:\RTG in a Can - 30 psig test\RTG in a Can - 30 psig - R1		- fr	m josevious.
6	Calculate charging pressure for gray 9 gallon Drierite 106-C ve		1	
7	0 01	essure (psig): 34	1	
8	Ensure vessel 106-C will not initially be pressure charged.			
9	Note valve V5 is open, to not charge vessel 106-C.		<u> </u>	
10	Note valve V6 is closed, to not charge vessel 106-C.		1	1
44	In Process Steps		2.00	0
11	Prepare container to be tested.			2
12	Install test can above ball valve on vessel 106-C.			2
13	Close and lock tower door. Seal with "In Use" yellow tape.			2
15	Turn on air compressor.			2
16	Adjust regulator PCV1 and use PRV1 to set and note charging	pressure: - Laure De A		
17	Set and record wind tunnel speed (Hz):	pressure. Typesed	1_	1
18	Set and record wind turner speed (112).			
19	Note valve VE is alosed to sharps vessel 106.0		1	
	Note valve V5 is closed, to charge vessel 106-C.		1	
20	Note valve V6 is open, to charge vessel 106-C.		1	
21	Verify gray vessel Drierite 106-C is pressurized.			
22		essure (psig): 33		
23	RKb. 2x10-5; 3x10-5;			
24	Turn aerosol particle counter on.		1	
25	Start AIM software for drop test sampling (60 sec count, 90 co	ount oveloc)	1	
(26)	Pre-drop BKG concentration validation. Note five cycles of 1 n		1	
27			-	
	The state of the s	sents-Flinto		
28	Toggle ball valve above gray vessel Drierite 106-C for a one to			
29	Note sample number of aerosol particle counter. 10 th Sar	mple number at pulse: 10 th	1	
30	(1th) 3x10-5 my/m3:			
21	Post-test Steps		7	
31	Save data files, record file names and location	oor	-	
33	Verify background is about 1.0E-5 mg/m^3 before opening do Open RRFMC door	our.		
34	(Optional) DR measurement			-
35	(Optional) DR Measurement filter.			
_	Turn air compressor off — open theed value			
_	Perform post-test activities		-	
	RRFMC data analysis and test report.			
	SANY 59T \$120 \$5142L 15T			
		sistant 2: DAVIS		
		sistant 3:		
		sistant 4:		
	Note: Only record the operator number after completion of			
	Mary St.			
	Z:\RTG in a Can - 30 psig test\[Punchlist - RTG in a Can - 30 psig - R2.xlsx]S:	Sheet1		
	The state of the s			
	& container cleaning steps		Operator	Assistant
	The state of the s	ote	Operator	Assistant
Tower	& container cleaning steps Preliminary Steps No		Operator number*	Assistant number
	& container cleaning steps Preliminary Steps No	ote		



Fourth SAVY Test

Fourth SAVY test

2ND -SANY 5QT - \$120 \$5142L - New pressurred powder punchlist.

	Preliminary Steps	Note	Operator	Assistant
1	Walk through room 103 and organize work area.		1	Hamber
2	Record the date, operator, logbook name & page.		i	
_			+1	
3	Record serial number and volume of test can		-+I	
4	Note room temp (deg F). 80 MECKO ME			
5	Open Z:\RTG in a Can - 30 psig test\RTG in a Can - 30 p		/	
6	Calculate charging pressure for gray 9 gallon Drierite 1			
7	Note charging pressure (psig):	Pressure (psig): 3 Y		
8	Ensure vessel 106-C will not initially be pressure charge	ed		
9	Note valve V5 is open, to not charge vessel 106-C.			
10	Note valve V6 is closed, to not charge vessel 106-C.		ı	
	In Process Steps			
11	Prepare container to be tested.		1	2
12	Install test can above ball valve on vessel 106-C.		12_	2
13	Close and lock tower door. Seal with "In Use" yellow to	ape.	1	2
14				
15	Turn on air compressor.		7	2
16	Adjust regulator PCV1 and use PRV1 to set and note ch	narging pressures it needed,	7	2
17	Set and record wind tunnel speed (Hz):	(27 Hz)	1	
18				
19	Note valve V5 is closed, to charge vessel 106-C.		P	2
20	Note valve V6 is open, to charge vessel 106-C.		te	2
21	Verify gray vessel Drierite 106-C is pressurized.			2
22	Verify charging (system) pressure on PI3: 33	Pressure (psig): 33	1	2
23	7 0 0 7 7 7	Fressure (psig).	- 1	-
24	crease filename -			1
	Turn aerosol particle counter on.		1	-
25	Start AIM software for drop test sampling (60 sec cour		1	
26	Pre-drop BKG concentration validation. Note five cycle	es of 1 minute.		+
27	: 2×10-4.8×10-6; ;/x10	T C		
28	Toggle ball valve above gray vessel Drierite 106-C for a	one to two second pulse.		
29	Note sample number of aerosol particle counter. 64	Sample number at pulse: 6th		
30				
	Post-test Steps			
31	Save data files, record file names and location		1	
32	Verify background is about 1.0E-5 mg/m^3 before ope	ning door.		
33	Open RRFMC door			
34	(Optional) DR measurement			
35	(Optional) DR Measurement filter.			
36	Turn air compressor off - open fleed val	ve.		
37	Perform post-test activities			
38	RRFMC data analysis and test report.			
	CANCEL CONTRACTOR			
	SANY JOT - 012005142L 2ND			
	Date: 924-2020	Assistant 2: Dewis.		
	Logbook: p. 93 Nuc fil-6-Moore.	Assistant 3:		
	Operator 1: Monl	Assistant 4:		

Z:\RTG in a Can - 30 psig test\[Punchlist - RTG in a Can - 30 psig - R2.xlsx]Sheet1

ower	& container cleaning steps			
	Preliminary Steps	Note Operator number*	Assistan	
			number*	number
1	Spray silicone into HEPA cabinet & generic mixer	Optional		
2	Wipe RRFMC floor with clean cotton cloth			
3	Wipe the test container with a damp paper towel			
4				



Fifth SAVY Test

Fifth SAVY test

Calculate charging pressure for gray 9 gallon Drierite 106-C vessel for 30 psig pulse. Note charging pressure (psig): Ensure vessel 106-C will not initially be pressure charged. Note valve V5 is open, to not charge vessel 106-C. Note valve V6 is closed, to not charge vessel 106-C. In Process Steps Prepare container to be tested. Install test can above ball valve on vessel 106-C. Close and lock tower door. Seal with "In Use" yellow tape. Adjust regulator PCV1 and use PRV1 to set charging pressure if needed: Set and record wind tunnel speed (Hz): Note valve V5 is closed, to charge vessel 106-C. Note valve V6 is open, to charge vessel 106-C. Verify gray vessel Drierite 106-C is pressurized. Verify charging (system) pressure on PI3: Pressure (psig): 33 Turn aerosol particle counter on. Create filename with format: Logook and page, test series and ID info. Start AIM software for drop test sampling (60 sec count, 90 count cycles) Pre-drop BKG concentration validation. Note five cycles of 1 minute. 3 × 10 × 10 × 10 × 10 × 10 × 10 × 10 ×	1421	Assistant
Record the date, operator, logbook name & page. Record serial number and volume of test can. 5	34 34 1	
Record serial number and volume of test can. Note room temp (deg F). Note room temp (deg F). Note room temp (deg F). Note charging pressure for gray 9 gallon Drierite 106-C vessel for 30 psig pulse. Note charging pressure (psig): Ensure vessel 106-C will not initially be pressure charged. Note valve V5 is open, to not charge vessel 106-C. In Process Steps Prepare container to be tested. Install test can above ball valve on vessel 106-C. Close and lock tower door. Seal with "In Use" yellow tape. Adjust regulator PCV1 and use PRV1 to set charging pressure if needed: Set and record wind tunnel speed (Hz): Note valve V5 is closed, to charge vessel 106-C. Note valve V5 is closed, to charge vessel 106-C. Note valve V5 is closed, to charge vessel 106-C. Verify gray vessel Drierite 106-C is pressurized. Verify charging (system) pressure on PI3: Pressure (psig): 33 Turn aerosol particle counter on. Create filename with format: Logook and page, test series and ID info. Start AIM software for drop test sampling (60 sec count, 90 count cycles) Pre-drop BKG concentration validation. Note five cycles of 1 minute. 3×10 ⁻¹¹ Toggle ball valve above gray vessel Drierite 106-C for a one to two second pulse.	34 34 1	
Record serial number and volume of test can. 5	34 34 1	
Note room temp (deg F). Note room temp (deg F). Note Calculate charging pressure for gray 9 gallon Drierite 106-C vessel for 30 psig pulse. Note charging pressure (psig): Ensure vessel 106-C will not initially be pressure charged. Note valve V5 is open, to not charge vessel 106-C. In Process Steps Prepare container to be tested. Install test can above ball valve on vessel 106-C. Close and lock tower door. Seal with "In Use" yellow tape. Adjust regulator PCV1 and use PRV1 to set charging pressure, if needed: Set and record wind tunnel speed (Hz): Note valve V5 is closed, to charge vessel 106-C. Note valve V5 is closed, to charge vessel 106-C. Adjust regulator PCV1 and use PRV1 to set charging pressure, if needed: Set and record wind tunnel speed (Hz): Verify gray vessel Drierite 106-C is pressurized. Verify gray vessel Drierite 106-C is pressurized. Verify charging (system) pressure on PI3: Pressure (psig): 33 Turn aerosol particle counter on. Create filename with format: Logook and page, test series and ID info. Start AIM software for drop test sampling (60 sec count, 90 count cycles) Pre-drop BKG concentration validation. Note five cycles of 1 minute. 3 × 10 × 10 × 10 × 10 × 10 × 10 × 10 × 1	34 34 1	
Calculate charging pressure for gray 9 gallon Drierite 106-C vessel for 30 psig pulse. Note charging pressure (psig): Ensure vessel 106-C will not initially be pressure charged. Note valve V5 is open, to not charge vessel 106-C. In Process Steps Prepare container to be tested. Install test can above ball valve on vessel 106-C. Close and lock tower door. Seal with "In Use" yellow tape. Adjust regulator PCV1 and use PRV1 to set charging pressure if needed: Set and record wind tunnel speed (Hz): Note valve V5 is closed, to charge vessel 106-C. Note valve V5 is closed, to charge vessel 106-C. Note valve V6 is open, to charge vessel 106-C. Verify gray vessel Drierite 106-C is pressurized. Verify charging (system) pressure on PI3: Pressure (psig): 33 Turn aerosol particle counter on. Create filename with format: Logook and page, test series and ID info. Start AIM software for drop test sampling (60 sec count, 90 count cycles) Pre-drop BKG concentration validation. Note five cycles of 1 minute. 3×10 ⁻¹⁴ ; Toggle ball valve above gray vessel Drierite 106-C for a one to two second pulse.	34 1	
7 Note charging pressure (psig): 8 Ensure vessel 106-C will not initially be pressure charged. 9 Note valve V5 is open, to not charge vessel 106-C. 10 Note valve V6 is closed, to not charge vessel 106-C. 11 Process Steps 11 Prepare container to be tested. 12 Install test can above ball valve on vessel 106-C. 13 Close and lock tower door. Seal with "In Use" yellow tape. 14 Turn on air compressor. 16 Adjust regulator PCV1 and use PRV1 to set charging pressure if needed: 17 Set and record wind tunnel speed (Hz): 18 2 2 2 Verify gray vessel Drierite 106-C is pressurized. 29 Verify charging (system) pressure on PI3: 20 Pressure (psig): 33 21 Turn aerosol particle counter on. 20 Start AIM software for drop test sampling (60 sec count, 90 count cycles) 21 Pre-drop BKG concentration validation. Note five cycles of 1 minute. 3 × 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10	34 1	
8 Ensure vessel 106-C will not initially be pressure charged. 9 Note valve V5 is open, to not charge vessel 106-C. 10 Note valve V6 is closed, to not charge vessel 106-C. 11 In Process Steps 11 Prepare container to be tested. 12 Install test can above ball valve on vessel 106-C. 13 Close and lock tower door. Seal with "In Use" yellow tape. 14 Turn on air compressor. 16 Adjust regulator PCV1 and use PRV1 to set charging pressure if needed: 17 Set and record wind tunnel speed (Hz): 18 Pote valve V5 is closed, to charge vessel 106-C. 20 Note valve V6 is open, to charge vessel 106-C. 21 Verify gray vessel Drierite 106-C is pressurized. 22 Verify charging (system) pressure on PI3: 23 Turn aerosol particle counter on. 24 Create filename with format: Logook and page, test series and ID info. 25 Start AIM software for drop test sampling (60 sec count, 90 count cycles) 26 Pre-drop BKG concentration validation. Note five cycles of 1 minute. 3 × 10 × 10 × 10 × 10 × 10 × 10 × 10 ×	1	
Note valve V5 is open, to not charge vessel 106-C. Note valve V6 is closed, to not charge vessel 106-C. In Process Steps Prepare container to be tested. Install test can above ball valve on vessel 106-C. Close and lock tower door. Seal with "In Use" yellow tape. Adjust regulator PCV1 and use PRV1 to set charging pressure, if needed: Set and record wind tunnel speed (Hz): Note valve V5 is closed, to charge vessel 106-C. Note valve V6 is open, to charge vessel 106-C. Verify gray vessel Drierite 106-C is pressurized. Verify charging (system) pressure on PI3: Pressure (psig): 33 Turn aerosol particle counter on. Create filename with format: Logook and page, test series and ID info. Start AIM software for drop test sampling (60 sec count, 90 count cycles) Pre-drop BKG concentration validation. Note five cycles of 1 minute. 3×10 ⁻¹⁴ ; Toggle ball valve above gray vessel Drierite 106-C for a one to two second pulse.		
Note valve V6 is closed, to not charge vessel 106-C. In Process Steps 11 Prepare container to be tested. 12 Install test can above ball valve on vessel 106-C. 13 Close and lock tower door. Seal with "In Use" yellow tape. 14		
In Process Steps 11 Prepare container to be tested. 12 Install test can above ball valve on vessel 106-C. 13 Close and lock tower door. Seal with "In Use" yellow tape. 14		
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26 Pre-drop BKG concentration validation. Note five cycles of 1 minute. 3x10 ⁻⁴ ; 27 2x10 ⁻⁵ ; 2x10 ⁻⁵ ; 1x10 ⁻⁵ 28 Toggle ball valve above gray vessel Drierite 106-C for a one to two second pulse.	- I	
27 2x10-5; 2x 10-5; 1x10-5 2x 10-5; 2x 10-5 2x 10-5 2x 10-5 2x 10-5; 1x10-5 2x		
Toggle ball valve above gray vessel Drierite 106-C for a one to two second pulse.	1	
29 Note sample number of aerosol particle counter. Sample number at pulse:	(70) I	
30 #25 = 9x10-7 mg/m3		
Post-test Steps		
31 Save data files, record file names and location		
32 Verify background is about 1.0E-5 mg/m^3 before opening door.		
33 Open RRFMC door		
34 (Optional) DR measurement		
35 (Optional) DR Measurement filter.		
Turn air compressor off and open bleed valve.		
37 Perform post-test activities		
38 RRFMC data analysis and test report.		
Date: 9-24-2020 Assistant 2: DAVIS		
Logbook: P. 93 NUCFILT 6-MOORL Assistant 3:		
Operator 1: Mook		

Tower & container cleaning steps

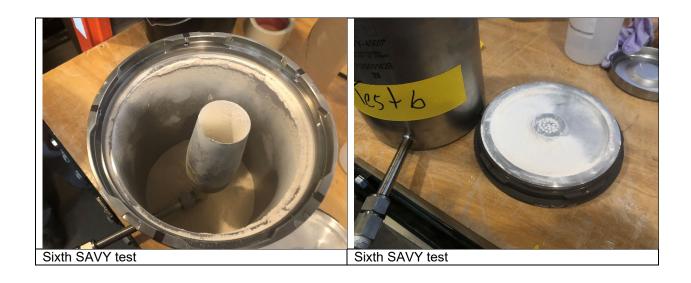
Preliminary Steps

Note

Operator number*

Assistant number

	Preliminary Steps	Note	number*	number
1	Spray silicone into HEPA cabinet & generic mixer	Optional		
2	Wipe RRFMC floor with clean cotton cloth			
3	Wipe the test container with a damp paper towel			
4				

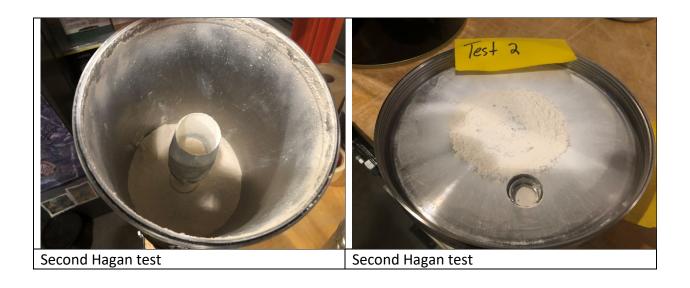


1ST HAGAN 8QT CAN 08-56-58154

	proliminary Stans FILTER # NUCFIL 013 Not	2/4/10	Ceo Operator	Assistant	
	Preliminary Steps PILTER # NUCFIL -013 Not LANL-559 89-86 noted 9-28	te 28 VIH	number*	number	
1	Walk through room 103 and organize work area.		1		
2	Record the date, operator, logbook name & page.		1		
3	Turn on air compressor.		i		
4	Set up hi-speed cameras.				
5	Set up room AC. 70°F Sept 22, 2020 NIA -				
6	(optional) Set up AC/heater in wind tunnel test section.	1A-			
7	(optional) Set up humidifier.				
8	Record TA-6 outdoor temp and RH% (optional).				
9	Prepare container to be tested, put fiducial makers on NA				
	In Process Steps				
10		in on dop of Drievite 106-	C.		
11	Take picture and measure angle of test item.	NOT YOU	1		
12	Close and lock tower door.		1		
13	Set wind tunnel speed. (2112)				
14		24 HZ			
15	Record tunnel temperature and RH%.				
16	Turn aerosol particle counter on.		1		
17	Start AIM software for drop test sampling.				
18	Pre-drop BKG concentration validation.				
19	Undo lockout and turn on drop tester switch N(A		*		
20	Sweep room 103 for other personnel N/A		*		
21			*		
			*		
22	Determine needed value for measuring tape. N		*		
23	Note tape height T, and net height H. N/A				
24	Raise platen to tape height, T (net height, H). N (/)		*		
25	Drop the toad. open value for 30 pring lest		*		
26	Trigger hi-speed cameras				
27	Turn off drop tester at remote control.		*		
28	Re-install the lockout lock.		*		
29	Note sample number of aerosol particle counter.				
30	Background concentration validation				
-	Post-test Steps				
31	Reset drop tester				
32	Save data files, record file names and location	0			
33	Open RRFMC door	TOO CEOZ LOAD (MAR)		,	
34	(Optional) DR-measurement-	84 a remain in can -but	loosely	removed	, 3
35	(Optional) DR Measurement filter.	wa Remain on I'd /filet,	MERION	5tuck-5	-boks
36	Turn air compressor off	1	Į.		0
37	Perform post-test activities Photo of 1.61 g of C	ieo 2 on ovange beaker li	l for con		U
38	RRFMC data analysis and test report.	7		1	
Drop	tester - RRFMC\Operation procedure\RP-SVS-RIC-TR-100-R1 RRFMC update			1	
	These tasks(*) are to be performed only by the designated of	operator for physical control of t	he key.		
	V				
		sistant 2: Now .			
	Logbook: NucFilt - 6-Moore p. 87 Ass	sistant 3:			



Operation procedure sunchist and container information sheet. (RTG in a can - 30 psig series) Preliminary Steps Note Operator Note Record she date, operator, logbook name & page. 2 Record she date, operator, logbook name & page. 3 Record serial number and volume of test can. 4 Note room temp (deg F). ○───────────────────────────────────	Ope
1 Walk through room 103 and organize work area. 2 Record the date, operator, logbook name & page. 3 Record serial number and volume of test can. 4 Note room temp (deg F). 6 7 "F 5 ZNRTG in a Can- 30 psig test/Moore ME 2020 RTG in a Can- 30 psig test./sx 6 Calculate charging pressure for gays agailon Drierite 106-C vessel for 30 psig pulse. 7 Note charging pressure for gays agailon Drierite 106-C vessel for 30 psig pulse. 8 Ensure vessel 106-C will not initially be pressure charged. 9 Note valve V5 is closed, to not charge vessel 106-C. 10 Note valve V5 is closed, to not charge vessel 106-C. 11 Prepare container to be tested. 12 Install test can above ball valve on vessel 106-C. 13 Close and lock tower door. Seal with "in Use" yellow tape. 14 15 Turn on air compressor. 16 Adjust regulator PCV1 and use PRV1 to set charging pressure, if needed: 36 Ps ig. 17 Set and record wind tunnel speed (hz): 24,0 18 19 Note valve V5 is closed, to charge vessel 106-C. 20 Note valve V5 is closed, to charge vessel 106-C. 21 Verify charging (system) pressure on P18: 36 ps ig. 22 Verify charging (system) pressure on P18: 36 ps ig. 23 Turn aerosol particle counter on. 12.19 PM 24 Create fillename with format: Logook and page, test series and ID Info. NucFilt Can- 6- Mode, p. 71-3 T. Hay 25 Turn aerosol particle counter on. 12.19 PM 25 Turn aerosol particle counter on. 12.19 PM 26 Pre-drop BKG concentration validation. Note five cycles of 1 minute. 1.43 Note 3 mg/pm 3 27 7 × 60 2, 6 km 6 1, 0.0 7 Pm NicF 1, 6, 1 NicF 2 28 Toggie ball valve above gray vessel Drierite 106-C for a one to two second pulse. 30 (1) 0.19 1 mg/pm 3 31 Save data files, record file names and location 32 Verify background is about 1.0E-5 mg/m3 before opening door. 33 Open RRFMC dota analysis and test report. 4 HNEAR CAN 63 -6 93 154 5 File Date: 9-28 -2-29 Close Counter. 15 Sample number at pulse: 15 Ps Ps Counter Counter. 15 Sample number at pulse: 15 Ps Ps Counter Counter. 15 Sample number at pulse: 15 Sample number at pulse: 15 Sample number at pulse: 15 Sam	
2 Record the date, operator, logbook name & page. 3 Record serial number and volume of test can. 4 Note room temp (deg F). 6 7 ° F 5 ZNRTG in a Can - 30 psig test/Moore ME 2020 RTG in a Can - 30 psig test.xisx 6 Calculate charging pressure for gray *gallon Drierite 106-C vessel for 30 psig pulse. 7 Note charging pressure (psig): 8 Ensure vessel 106-C will not initially be pressure charged. 9 Note valve V5 is open, to not charge vessel 106-C. 10 Note valve V5 is closed, to not charge vessel 106-C. 11 Process Steps 11 Prepare container to be tested. 12 Install test can above ball valve on vessel 106-C. 13 Close and lock tower door. Seal with "in Use" yellow tape. 14 Turn on air compressor. 16 Adjust regulator PCV1 and use PRV1 to set charging pressure, if needed: 26 psig. 17 Set and record wind tunnel speed (Hz): 24,0 18 19 Note valve V5 is open, to charge vessel 106-C. 20 Note valve V5 is closed, to charge vessel 106-C. 21 Verify gray vessel Drierite 106-C is pressurized. 22 Verify charging (system) pressure on P18: 36 ps/gy Pressure (psig): 36 ps/gy 23 Turn aerosol particle counter on. [2:197/M] 23 Turn aerosol particle counter on. [2:197/M] 24 Create filename with format: Logook and page, test series and iD info. NucFilt Can, 6 Mpoe p. 17 - 3 CT Nege 25 Start AlM software for drop test sampling (60 sec count, 90 count cycles) NucFilt Can, 6 Mpoe p. 17 - 3 CT Nege 26 Pre-drop BK6 concentration validation. Note five cycles of 1 minute. I. H3 xto 3 mg/m² 3 27 9 xto 5 3 C xto 5 1 0.0 7 7.5 Xto 7 6 1.0 No 7 7 8 Xto 7 1 0.0 Note sample/number of aerosol particle counter. # 7 2 Start AlM software for drop test sampling (60 sec count, 90 count cycles) NucFilt Con 1 2 29 Van L21/3 . Az 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1
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8 Ensure vessel 106-C will not initially be pressure charged. 9 Note valve VS is open, to not charge vessel 106-C. 10 Note valve VS is closed, to not charge vessel 106-C. In Process Steps 11 Prepare container to be tested. 12 Install test can above ball valve on vessel 106-C. 13 Close and lock tower door. Seal with "In Use" yellow tape. 14 Turn on air compressor. 16 Adjust regulator PCV1 and use PRV1 to set charging pressure, if needed: 26 PSIQ. 17 Set and record wind tunnel speed (Hz): 24.0 18 19 Note valve VS is closed, to charge vessel 106-C. 20 Note valve VS is closed, to charge vessel 106-C. 21 Verify gray vessel Drierite 106-C is pressurized. 22 Verify charging (system) pressure on PI3: 36 psiq. 23 Turn aerosol particle counter on. 12:17.8 M 24 Create filename with format: Logook and page, test series and ID info. Nuc Filt Comm. 6 Moole p. 91-3 CT. Have 25 Start AlM software for drop test sampling (60 sec count, 30 count cycles) Nuc Filt Comm. 6 Moole p. 91-3 CT. Have 26 Pre-drop BKG concentration validation. Note five cycles of 1 minute. 1.48 kto 3 mg/him 3 25 Start AlM software for drop test sampling (60 sec count, 30 count cycles) Nuc Filt Comm. 6 Moole p. 91-3 CT. Have 26 Pre-drop BKG concentration validation. Note five cycles of 1 minute. 1.48 kto 3 mg/him 3 26 Pre-drop BKG concentration validation. Note five cycles of 1 minute. 1.48 kto 3 mg/him 3 27 9 kto 3.6 kto 4 p. 0.9 7.5 xto 4 6.1 kto 4 28 Toggie ball valve above gray vessel Drierite 106-C for a one to two second pulse. 29 Note sample number of aerosol particle counter. 1 Sample number at pulse: 17 20 (Dt 0.19 mg/him 2 Save data files, record file names and location 30 (Dp 0.19 mg/him 2 Save data files, record file names and location 31 Save data files, record file names and location 32 Verify background is about 1.0E-5 mg/m ² 3 before opening door. 33 Open RRFMC door 34 (Optional) DR Measurement filter. 35 Turn air compressor off and open bleed valve. 36 Turn air compressor off and open bleed valve. 37 Perform p	-
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24 Create filename with format: Logook and page, test series and ID info. Nuc Filt Cam6 - Move p. 97-3 ct. Hay 25 Start AIM software for drop test sampling (60 sec count, 90 count cycles) Nuc Filt Cam6 - Move p. 97-3 ct. Hay 26 Start AIM software for drop test sampling (60 sec count, 90 count cycles) Nuc Filt Cam6 - Move p. 97-3 ct. Hay 26 Start AIM software for drop test sampling (60 sec count, 90 count cycles) Nuc Filt Cam6 - Move p. 97-3 ct. Hay 26 Start AIM software for drop test sampling (60 sec count, 90 count cycles) Nuc Filt Cam6 - Move p. 97-3 ct. Hay 26 Start AIM software for drop test sampling (60 sec count, 90 count cycles) Nuc Filt Cam6 - Move p. 97-3 ct. Hay 26 Start AIM software for drop test sampling (60 sec count, 90 count cycles) Nuc Filt Cam6 - Move p. 97-3 ct. Hay 26 Start AIM software for drop test sampling (60 sec count, 90 count cycles) Nuc Filt Cam6 - Move p. 97-3 ct. Hay 27-3 ct.	23
25 Start AIM software for drop test sampling (60 sec count, 90 count cycles) NWCFIL-019 2-88 LANL 24/73. A2 26 Pre-drop BKG concentration validation. Note five cycles of 1 minute. I.48 kto 8 mg/m ³ 27 9 xto - 3,6 xto - 1,0,0,7,5 xto - 7,6 lxto - 7 28 Toggle ball valve above gray vessel Drierite 106-C for a one to two second pulse. 29 Note sample number of aerosol particle counter. A Sample number at pulse: 47 30 (7) 0.4 n m/m ³ s Post-test Steps 31 Save data files, record file names and location 32 Verify background is about 1.0E-5 mg/m ³ before opening door. 33 Open RRFMC door 34 (Optional) DR Measurement 35 (Optional) DR Measurement filter. 36 Turn air compressor off and open bleed valve. 37 Perform post-test activities 38 RRFMC data analysis and test report. 48 ASSISTANT 2: MOORE 57 Date: 9 - 18 - 10 10 10 10 10 10 10 10 10 10 10 10 10	-
26 Pre-drop BKG concentration validation. Note five cycles of 1 minute. 1.48 x 10 8 mg/m ³ . 27 9 x 10 - 3, 6 x 10 + 0, 0, 7,5 x 10 + 6,1 x 10 + 7 28 Toggle ball valve above gray vessel Drierite 106-C for a one to two second pulse. 29 Note sample number of aerosol particle counter. Sample number at pulse: Post-test Steps 30 (1) 0.4 n w 10 m ³ Post-test Steps 31 Save data files, record file names and location 32 Verify background is about 1.0E-5 mg/m ³ before opening door. 33 Open RRFMC door 34 (Optional) DR measurement 35 (Optional) DR Measurement filter. 36 Turn air compressor off and open bleed valve. 37 Perform post-test activities 38 RRFMC data analysis and test report. HACAN CAN 88-86 - 88154 FILES NUCFIL-019 2-88 LANL 2143 - 5184 DIA TOROW 10.6 LBF. Date: 9-18-1010 - Moore 10.9 Moore 10.9 Moore 10.6 Logbook: NUCFIL-6 - Moore 10.4 Moore 10.6 LBF. Assistant 2: Moore 10.6 LBF. Assistant 3: Operator 1: Moore 10.4 Moore 10.9 Moore 10.8 Moore	
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Toggle ball valve above gray vessel Drierite 106-C for a one to two second pulse. 29 Note sample number of aerosol particle counter.	
Toggle ball, valve above gray vessel Drierite 106-C for a one to two second pulse. 29 Note sample number of aerosol particle counter. Sample number at pulse: 7 30 (2) o.1.10 Molan3 Post-test Steps 31 Save data files, record file names and location 32 Verify background is about 1.0E-5 mg/m^3 before opening door. 33 Open RRFMC door 34 (Optional) DR measurement 35 (Optional) DR Measurement filter. 36 Turn air compressor off and open bleed valve. 37 Perform post-test activities 38 RRFMC data analysis and test report. HAGAN CAN S8-6 - S154 FILITAL NUCFIL-6 - S154 Date: 9-18-2010 Assistant 2: MOORE Logbook: NUCFIL-6 - MOORE C. 94 Assistant 3: Operator 1: MOORE C. 94 Assistant 4:	2.
30 (7) 0.1 m m/m³ " Post-test Steps 31 Save data files, record file names and location 32 Verify background is about 1.0E-5 mg/m^3 before opening door. 33 Open RRFMC door 34 (Optional) DR Measurement 35 (Optional) DR Measurement filter. 36 Turn air compressor off and open bleed valve. 37 Perform post-test activities 38 RRFMC data analysis and test report. HAGAN CAN Ø8-Ø6 -Ø8154 FILDER NUCFIL-Ø19 2-Ø8 LANL 2143 -5784 DIA TORRUM 10.6 LBF. Date: 9-18-1010 Assistant 2: MOORE Logbook: NUCFIL-6 Moore P6-94 Assistant 3: Operator 1: Moore DANLS Assistant 4:	28
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34 (Optional) DR measurement 35 (Optional) DR Measurement filter. 36 Turn air compressor off and open bleed valve. 37 Perform post-test activities 38 RRFMC data analysis and test report. HAGAN CAN 88-86-88154 FILTER NUCFIL-817 2-88 LANL 2143 5784 DIA TORRUM 10.6 VBF. Date: 9-28-2020 Assistant 2: MOORE Logbook: NUCFIL-6-MOORE FG. 744 Assistant 3: Operator 1: MOORE DAVIS Assistant 4:	_
35 (Optional) DR Measurement filter. 36 Turn air compressor off and open bleed valve. 37 Perform post-test activities 38 RRFMC data analysis and test report. HAGAN CAN 88-86-88154 FILTER NUCFIL-819 2-88 LANL 2143 5784 DIA TORRUM 10.6 UBF. Date: 9-28-2020 Assistant 2: MOORE Logbook: NUCFIL-6-MOORE FG. 94 Assistant 3: Operator 1: MOORE DAVIS Assistant 4:	_
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37 Perform post-test activities 38 RRFMC data analysis and test report. HAGAN CAN 88-86-88154 FILTER NUCFIL-8112-88 LANL 2143 5784 DIA TORRING 10.6 UBF. Date: 9-28-2020 Logbook: NUCFIL-6-Moorre PC. 94 Assistant 2: MOORE Operator 1: Moorre DAVLS Assistant 4:	
38 RRFMC data analysis and test report. HAGAN CAN 88-86 - 88154 FILPER NUCFIL-811 2-88 LANL 2143 - 5784 DIA TORRUM 10.6 UBF. Date: 9-28-2020 Assistant 2: MOORE Logbook: NUCFIL-6-Moore FC. 94 Assistant 3: Operator 1: Moore DAVL5 Assistant 4:	
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Operator 1: Assistant 4:	
	<u> </u>
Z:\RTG in a Can - 30 psig test\\Punchlist - RTG in a Can - 30 psig - R2.xlsx Sheet1	
Tower & container cleaning steps	Tow
Preliminary Steps Note Operator Assistant	
number number	
	1
3 Wipe the test container with a damp paper towel 4	2



		RIE ma CAN fest name ser		16/17/	86	7 1
	Opera	tion procedure punchlist and container information shee	et. (RTG in a can - 30 psig series)	Operator	Assistant	
		Preliminary Steps	Note	number	number	
7	1	Walk through room 103 and organize work area.			2	-
U.	2	Record the date, operator, logbook name & page.			2	
	3	Record serial number and volume of test can			2	
	4	Note room temp (deg F).				
(OPE)	5	Z:\RTG in a Can - 30 psig test\Moore ME 2020 RTG in a C	an - 30 psig test.xlsx		2	
0.5	6	Calculate charging pressure for gray 9 gallon Drierite 106				
	7	Note charging pressure (psig): 37 osig texast	Pressure (psig):			
	8	Ensure vessel 106-C will not initially be pressure charged	l.			
	9	Note valve V5 is open, to not charge vessel 106-C.	ľ	1		
	10	Note valve V6 is closed, to not charge vessel 106-C.		1		
		In Process Steps				
	11	Prepare container to be tested.		1		
	12	Install test can above ball valve on vessel 106-C.		1		
	13	Close and lock tower door. Seal with "In Use" yellow tap	e.	1		
	14					
	15	Turn on air compressor.		1		
	16	Adjust regulator PCV1 and use PRV1 to set charging pres	sure, if needed:	1		
	17	Set and record wind tunnel speed (Hz):	2		2	
	18					
	19	Note valve V5 is closed, to charge vessel 106-C.		/		
	20	Note valve V6 is open, to charge vessel 106-C.		1		
	21	Verify gray vessel Drierite 106-C is pressurized.		1		
	22		Pressure (psig): 38 PS16	+′		
	_	Verify charging (system) pressure on PIB: 31 pcg		•	2	
	23	Turn aerosol particle counter on.	379516			A -(S)
)	24	Create filename with format: Logook and page, test serie	es and ID info. pg 95 - 800 Haga	m-Biter 1	MCFU-0/9	208
1 .	25	Create filename with format: Logook and page, test serie Start AIM software for drop test sampling (60 sec count,	90 count cycles) 3:33PM	0.00		2012 -
	26	Pre-drop BKG concentration validation. Note five cycles	of 1 minute.			210.
	27					
	28	Toggle ball valve above gray vessel Drierite 106-C for a o	one to two second nulse			
	29	Note sample number of aerosol particle counter.	Sample number at pulse:		-	
	30	(1) 9 7x10-20(12) 5 10x10-2 ma/m3 , 2.1 x10-	2: (#60 n.4 x10	d	1	
		(1) 9.7×10-2 (12) 5.6×10-2 mg/m3, 2,1 ×10-	, (100)1.120			
	31	Save data files, record file names and location				
	32	Verify background is about 1.0E-5 mg/m^3 before openi	ng door.			
	33	Open RRFMC door				
	34	(Optional) DR measurement				
	35	(Optional) DR Measurement filter.				
	36	Turn air compressor off and open bleed valve.				
	37	Perform post-test activities				
	38	RRFMC data analysis and test report.			F	
		HABAN-CAN-08-06-08(54				
		FILTER NUCFIL- Ø19 2 88 LANZ 36		10.6 LBT	TORON	
		Date: 9-18-1010	Assistant 2: MORRE			
		Logbook: pg MCFIL- 6-MOORE	Assistant 3:			
		Operator 1: DANS	Assistant 4:			
		Note: Only record the operator number after completic				d to
			.xisx]Sheet1 500% flu	MINCO	n- reco	nalethis
	T	Z:\RTG in a Can - 30 psig test\[Punchlist - RTG in a Can - 30 psig - R2	xisxisneet1	00 00	to 00	95406
	Tower	& container cleaning steps	1		To I'd	
Y		Preliminary Steps	Note	Operator	Assistant	
J.			2	number*	number	~
	1	Spray silicone into HEPA cabinet & generic mixer	Optional			
		Wipe RRFMC floor with clean cotton cloth	1			
	2					
	3	Wipe the test container with a damp paper towel				



TEST 4TH HAGAN

	Preliminary Steps	Note	Operator	Assistant
			number	number
1	Walk through room 103 and organize work area.		-/	-
2	Record the date, operator, logbook name & page.			2
3	Record serial number and volume of test can.	l.		2
4	Note room temp (deg F). 68°F			2
5	Z:\RTG in a Can - 30 psig test\Moore ME 2020 RTG in a C	Can - 30 psig test.xlsx	-	2
6	Calculate charging pressure for gray 9 gallon Drierite 106			2
7	Note charging pressure (psig): 37 PS (6	Pressure (psig): 37-P516		2
8	Ensure vessel 106-C will not initially be pressure charged	d.		3
9	Note valve V5 is open, to not charge vessel 106-C.		(1
10	Note valve V6 is closed, to not charge vessel 106-C.			
	In Process Steps	A 1		
11	Prepare container to be tested. 100.0 a Cellinstall test can above ball valve on vessel 106-CS	02+5% by wt. fluores	cens	
12	Install test can above ball valve on vessel 106-C√			
13	Close and lock tower door. Seal with "In Use" yellow tap	oe.	1	
14				
15	Turn on air compressor.		1	
16	Adjust regulator PCV1 and use PRV1 to set charging pres	sure, if needed:		
17	Set and record wind tunnel speed (Hz):	2448		
18		, , , , , , , , , , , , , , , , , , ,		
19	Note valve V5 is closed, to charge vessel 106-C.		1	
20	Note valve V6 is open, to charge vessel 106-C.		1	
21	Verify gray vessel Drierite 106-C is pressurized.		ı	
22	Verify charging (system) pressure on PI3:	Pressure (psig): 38 P516	1	
23	Turn aerosol particle counter on.			2
24	Create filename with format: Logook and page, test serie	es and ID info.		2
25	Start AIM software for drop test sampling (60 sec count,			2
26	Pre-drop BKG concentration validation. Note five cycles	of 1 minute 6 3×10-5 mg/m3 5		2
27	Pre-drop BKG concentration validation. Note five cycles	my/3/22×10-6		2
28			—	
	Toggle ball valve above gray vessel Driefite 106-C for a o	ne to two second pulse.	<i></i>	2
29	Note sample number of aerosol particle counter. 6 TH PERX! (6 TH) 5.5×16-2-mg/m3 (7) (8)	Sample number at pulse: 67HV	1	
30	VEXX: (61H/3.5×16-249/M3(+)	7×10-2 (9) 7×10-3 (10)3	X10->	
21	Post-test Steps		-	
31	Save data files, record file names and location Verify background is about 1.0E-5 mg/m^3 before openi	ne door (#13) 3x 10-5 (STOP)	-	2
33	Open RRFMC door	ng door. (34-43) 3×10-3 (3101)		
34	(Optional) DR measurement		-	-
35	(Optional) DR Measurement filter.			
36	Turn air compressor off and open bleed valve.		1	
37	Perform post-test activities		+1	
38	RRFMC data analysis and test report.		_	-
30		512 and 1 10 0 1 D.T.	-00-011	<u>.</u>
	8QT HABAN -08-06 - 88154	578"DIA; 10.0 LBF	TOROU	٥'
	FILTER! NUCFIL-0/9 2-08 LANL3029	11-202		
_	Date: 9-29-2020	Assistant 2: MODRE		
	Logbook: PG. 96 NMCFILT - 6 - Moore Operator 1: DAVIS	Assistant 3: Assistant 4:		
	IL COMPANY OF THE WAYNERS	I ASSISTANT 4.		

Z:\RTG in a Can - 30 psig test\[Punchlist - RTG in a Can - 30 psig - R2.xlsx]Sheet1

Tower	& container cleaning steps			
	Preliminary Steps	Note	Operator number*	Assistant number
1	Spray silicone into HEPA cabinet & generic mixer	Optional	*	
2	Wipe RRFMC floor with clean cotton cloth			
3	Wipe the test container with a damp paper towel			
4				



5TH WAGAN TEST

	Preliminary Steps	Note	Operator number	Assistan
1	Walk through room 103 and organize work area.		/	Humber
2				2
3	Record the date, operator, logbook name & page.			
4	Record serial number and volume of test can. Note room temp (deg F).		+	2
			1	2
5	Z:\RTG in a Can - 30 psig test\Moore ME 2020 RTG in a Ca		-	2
6	Calculate charging pressure for gray 9 gallon Drierite 106-		-	
7	Note charging pressure (psig):	Pressure (psig): 37-P516	1	
8	Ensure vessel 106-C will not initially be pressure charged.	T	+	
9	Note valve V5 is open, to not charge vessel 106-C.		11/	
10	Note valve V6 is closed, to not charge vessel 106-C.		1	1
	In Process Steps		1.	
11	Prepare container to be tested.		1,	
12	Install test can above ball valve on vessel 106-C.			
13	Close and lock tower door. Seal with "In Use" yellow tape	e, T	1	
14				
15	Turn on air compressor.	<u> </u>	/	
16	Adjust regulator PCV1 and use PRV1 to set charging press	sure, if needed:		-
17	Set and record wind tunnel speed (Hz):		1	
18	19		1	-
19	Note valve V5 is closed, to charge vessel 106-C.		1	
20	Note valve V6 is open, to charge vessel 106-C.		1	
21	Verify gray vessel Drierite 106-C is pressurized.		l l	
22	Verify charging (system) pressure on PI3: 369516	Pressure (psig):		2
23	Turn aerosol particle counter on.		1	2
24	Create filename with format: Logook and page, test series	s and ID info.		2
25	Start AIM software for drop test sampling (60 sec count, 9	90 count cycles) 1:16 PM		2
26	Pre-drop BKG concentration validation. Note five cycles o		7	
27	10.00	(4h) 4.2x106; 1.7x10-6;	1 4410-5	2
28	- 1.11.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	CHAT CONTO	137110	-
	Toggle ball valve above gray vessel Drierite 106-C for a or	ne to two second pulse.	-	
30	Note sample number of aerosol particle counter (71h)	Sample number at pulse: (7)	-	
30	73 0.126 mg/m3; 4,0 x10-2-			-
31	Save data files, record file names and location			
32	Verify background is about 1.0E-5 mg/m^3 before opening	ng door	-	+
33	Open RRFMC door	ig door.	-	-
34	(Optional) DR measurement			-
35	(Optional) DR Measurement filter.		1	1
36	Turn air compressor off and open bleed valve.		+	
37	Perform post-test activities		-	
38	RRFMC data analysis and test report.			+
			-1	
	FILTOR NUCPIL-0/3 10-02 LANT 206 Date: 9-29-2020	2 3/2 DIA MILTIR.	10,4181	TOROU
	Date: 9-29 2020	Assistant 2:	10.110	(or de
	Logbook: Nuc Fil-6- Moure 190, 97	Assistant 3:		

Z:\RTG in a Can - 30 psig test\|Punchlist - RTG in a Can - 30 psig - R2.xlsx)Sheet1

	Preliminary Steps	Note	Operator number*	Assistant number
1	Spray silicone into HEPA cabinet & generic mixer	Optional		
2	Wipe RRFMC floor with clean cotton cloth			
3	Wipe the test container with a damp paper towel			
4				



6TH HAGAN TEST

	Preliminary Steps	Note	Operator number	Assistan number		
1	Walk through room 103 and organize work area.		1			
2	Record the date, operator, logbook name & page.			2		
3	Record serial number and volume of test can.			2		
4	Note room temp (deg F).			2		
5	Z:\RTG in a Can - 30 psig test\Moore ME 2020 RTG in a Ca	an - 30 psig test.xlsx		-		
6	Calculate charging pressure for gray 9 gallon Drierite 106-C vessel for 30 psig pulse.					
7		Pressure (psig):		1		
8	Ensure vessel 106-C will not initially be pressure charged.		1			
9	Note valve V5 is open, to not charge vessel 106-C.		1			
10	Note valve V6 is closed, to not charge vessel 106-C.		1			
	In Process Steps		Τ΄-	1		
11	Prepare container to be tested.		1			
12	Install test can above ball valve on vessel 106-C.		1			
13	Close and lock tower door. Seal with "In Use" yellow tape	2.	11			
14						
15	Turn on air compressor.		1			
16	Adjust regulator PCV1 and use PRV1 to set charging press	ure, if needed:				
17	Set and record wind tunnel speed (Hz): (24 H2)				
18						
19	Note valve V5 is closed, to charge vessel 106-C.					
20	Note valve V6 is open, to charge vessel 106-C.		1			
21	Verify gray vessel Drierite 106-C is pressurized.		1			
22	Verify charging (system) pressure on PI3:	Pressure (psig): 36 PS 16	1	2		
23	Turn aerosol particle counter on.	Pressure (psig).		12		
24			-	2		
_						
25	jotal trains software for drop test sampling too see count, so count cycles?					
_	Pre-drop BKG concentration validation. Note five cycles of 1 minute. 8 1/ x10 7: 1.3×10 4					
27	5.6x10-7mg/m3; 4x10-6; 5.8x10-6			2		
28	Toggle ball valve above gray vessel Drierite 106-C for a or					
29	Note sample number of aerosol particle counter. 3	Sample number at pulse: 'XXV	١			
30	Note sample number of aerosol particle counter. 71れ 0.180 may/m3; 5.1 x/0 つつり りんんのう 3.8 x Post-test deps	10-3; (#11) 2,5 ×10-3 mg/	n ³			
31	Save data files, record file names and location					
32	Verify background is about 1.0E-5 mg/m^3 before openin	g door.(41) 1,7×10-5		2		
33	Open RRFMC door					
34	(Optional) DR measurement					
35	(Optional) DR Measurement filter.					
36	Turn air compressor off and open bleed valve.					
37	Perform post-test activities					
38	RRFMC data analysis and test report.					
	FILTER: MUCFU-\$13 18-82 2213		RQUE: 10	14 LBF		
	Date:	Assistant 2:		-		
	Hoghook Mar Cit / Marson - Co	Assistant 3:				
	Logbook: Nuc-Fil-6- Moore.pg.98 Operator 1:	Assistant 4:				

BK6 WIPE OF LID TOP & Z:\RTG in a Can - 30 psig test\|Punchlist - RTG in a Can - 30 psig - R2.xlsx|Sheet1 CAN BODY BEOW LUD.

Towe	& container cleaning steps			
	Preliminary Steps	Note	Operator number*	Assistant number
1	Spray silicone into HEPA cabinet & generic mixer	Optional		
2	Wipe RRFMC floor with clean cotton cloth			
3	Wipe the test container with a damp paper towel			
4				



Files to locate metadata information.

- 1) "Z:\RTG in a Can 30 psig test\ Moore ME and JT Davis 11-19-20 Pressurizing Hagan and SAVY containers to 30-psig (air).docx"
- 2) "Z:\RTG in a Can 30 psig test\Excel calcs\RTG in a can summary of tests 11-10-20 R1.xlsx
- 3) Z:\RTG in a Can 30 psig test\Excel calcs\NucFilt Cans-6 Moore pg 86 2 Gal Cary 37 psig 1 mm hole in lid.xlsx
- 4) (1st SAVY) RRFMC for NucFilt Cans-6 Moore pg 88 5 QT SAVY 30 psig 100 g CeO2 template Oct 2020.xlsx
- 5) (2nd SAVY) NucFilt Cans-6 Moore pg 88 5 QT SAVY 30 psig 100 g CeO2.xlsx
- 6) (3rd SAVY) NucFilt Cans-6 Moore pg 92 5 QT SAVY 30 psig 100 g CeO2.xlsx
- 7) (4th SAVY) NucFilt Cans-6 Moore pg 93 5 QT SAVY 30 psig 012005142L.xlsx
- 8) (5th SAVY) NucFilt Cans-6 Moore pg 93 5 QT SAVY 30 psig 012005142L.xlsx
- 9) (6th SAVY) NucFilt Cans-6 Moore pg 93 5 QT SAVY 30 psig 012005142L.xlsx
- 10) (2nd Hagan 0.625-dia) NucFilt Cans-6 Moore pg 94 8 QT Hagan filter NUCFIL-019 2-08 LANL 2143 RRFMC template Oct 2020.xlsx
- 11) (3rd Hagan 0.625-dia) NucFilt Cans-6 Moore pg 95 8 QT Hagan filter NUCFIL-019 2-08 LANL 3012.txt
- 12) (4th Hagan 0.625-dia) NucFilt Cans-6 Moore pg 96 8 QT Hagan filter NUCFIL-019 2-08 LANL 3029.txt
- 13) (1st Hagan 0.375-dia) NucFilt Cans-6 Moore pg 87 8 QT Hagan 30 psig 100 g CeO2.xlsx
- 14) (5th Hagan 0.375-dia) NucFilt Cans-6 Moore pg 97 8 QT Hagan filter NUCFIL-013 10-02 LANL 2062.txt
- 15) (6th Hagan 0.375-dia) NucFilt Cans-6 Moore pg 98 8 QT Hagan filter NUCFIL-013 10-02 LANL 2213.txt